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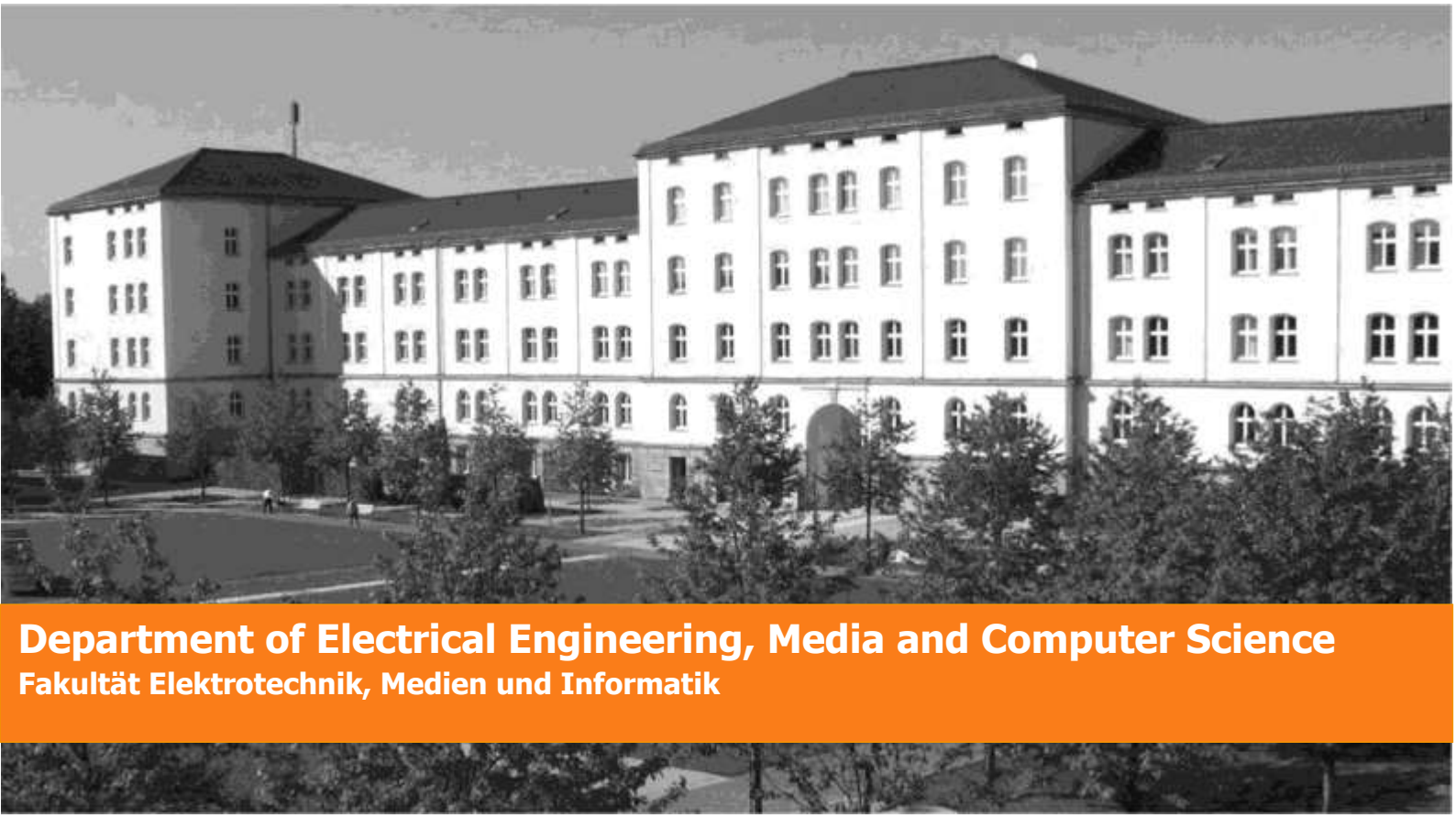
Course Catalogue – Bridge Modules

Modulhandbuch - Brückenmodule

Suitable for the master study programme

Artificial Intelligence for Industrial Applications

Künstliche Intelligenz für industrielle Anwendungen



Department of Electrical Engineering, Media and Computer Science

Fakultät Elektrotechnik, Medien und Informatik

created 2th october 2025

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Preliminary notes

Vorbemerkungen

The bridge modules give graduates of a Bachelor's degree programme with less than 210 ECTS (but at least 180 ECTS) the opportunity to acquire the missing ECTS.

They are suitable for the following master degree programme:

- Artificial Intelligence for Industrial Applications

• **Registration formalities:**

All examinations must be registered with the Students' Office (through PRIMUSS). Additional formalities are listed in the module descriptions.

• **Abbreviations:**

ECTS = The European Credit Transfer and Accumulation System (ECTS) is a credit point system for accreditation of course achievements.

SWS = Semesterwochenstunden = Semester hours per week

• **Workload:**

According to the Bologna Process, a credit point is based on a workload of 25-30 hours. The number of hours includes the time spent at the university, the time spent preparing for and following up on courses, the time spent writing papers or preparing for examinations.

Example calculation of workload (course with 4 SWS, 5 ECTS credits):

Workload: 5 ECTS x 30 h/ECTS = 150 h

- Lecture (4 SWS x 15 weeks) = 60 h
- Self study = 60 h
- Exam preparation = 30 h

_____

= 150 h

Modules

Industrie 4.0 Project

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	140P	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Amberg	English	one semester	summer/winter semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr. Gerald Pirkl	Prof. Dr. Gerald Pirkl

Prerequistes*
Voraussetzungen

Programming, digital systems, networks, basics of computer science, industrial process communication and industrial Ethernet, data analytics, industrial human-machine interfaces and augmented reality

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload
Bridge module for international master study programmes Elective for Bachelor study programmes Compulsory module in the Industry 4.0 Informatics	Project work	10h: Project meetings 140h: Project processing including documentation = 150 h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

After successfully completing the module, students have the following professional, methodological and personal skills:
Professional competence:
Students create industrial software with regard to reliability, availability and security (functional and cyber security) and can evaluate its elements accordingly. They know how sensor data can be collected, analyzed and applied to problems.
Methodological competence:
Students can evaluate and assess the project being worked on in terms of reliability, availability and security using appropriate software tools and application lifecycle management tools. They can analyze larger software projects and implement them in test-driven or scrum-based processes. You can apply various known technologies in the project environment.
Personal competence (social competence and self-competence):
Students can familiarize themselves independently with new subject areas and know how to work on a problem in a team using SCRUM using the subject areas taught in the previous semesters of the Industrie Informatik 4.0 course.

Course Content
Inhalte der Lehrveranstaltungen

Recording, planning and realization of a project on a current topic in the field of Industry 4.0 (e.g. simulation of a factory, communication, human-machine interaction, predictive maintenance, etc.).

Teaching Material / Reading
Lehrmaterial / Literatur

Literature from the lectures CPS, Data Analytics, Industrial Ethernet, Embedded Systems as well as lecture slides, individual literature depending on the project content.

Internationality
Internationalität (Inhaltlich)

Module is offered in English.
English and German literature is used.

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a)
Modulprüfungen

Type of examination *1) Prüfungsform	Type/scope including weighting *2) Art/Umfang inkl. Gewichtung	Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen
ModA	Project work of 150 hours; the objectives and content are defined in advance in an exposé and agreed with the lecturer. The project phase and the results are discussed in a report.	Independent processing of a larger CPS-related project in a team, analysis, planning, design and development of a solution approach for a problem

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

International Affairs & Intercultural Meeting

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	INT	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Online, Amberg	English, German	one semester	summer semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr.-Ing. Dominikus Heckmann	Prof. Dr.-Ing. Dominikus Heckmann

Prerequistes*
Voraussetzungen

Note: please also observe the preperquisites according to eximinations regulations law in the current version of the SPO.

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload
Bridge module for international master study programmes Elective for Bachelor study programmes	Seminar-based teaching with exercises	Contact time/coaching: 60 h Self-study and project work: 80 h Total workload: 140 h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

After successfully completing the module, students have the following professional, methodological and personal skills:
Professional competence:
Knowledge of the content of the course
Methodological competence:
Discussion culture, scientific work, presentation skills
Personal competence (social competence and self-competence):
improved interaction and teamwork skills, and group discussion in English and German, structured work and effective group work. Intercultural experience. Presentation & discussion experience in mixed groups.

Course Content
Inhalte der Lehrveranstaltungen

- International aspects (in general and in particular for technical studies)
- Intercultural aspects (in general and in particular for a technical degree program)
- Interlingual aspects (in general and in particular for technical studies)
- Regional characteristics of the Obepfalz & Bavaria with excursions
- Special features of the participating nationalities and native languages
- Partner universities, information and potential partners for the internship semester or an optional semester abroad
- KI.Meeting meetings, information on study organization
- Academic work (reading, writing, research)

Teaching Material / Reading
Lehrmaterial / Literatur

Teaching material
Will be announced at the beginning of the semester.

Internationality
Internationalität (Inhaltlich)

- This course will be taught biligual in English and German.
- All Teaching Materials and Readings will be offered in English and German.
- If possible, small intercultural groups are set up for group work

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a)
Modulprüfungen

Type of examination *1) Prüfungsform	Type/scope including weighting *2) Art/Umfang inkl. Gewichtung	Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen
ModA		Learning objectives / qualifications of the module, see above

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

Robotics Starter & Meeting

Künstliche Intelligenz

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	ROS	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Amberg	EN (50%) + DE (50%) Bilingual	one semester	summer semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr. Dominikus Heckmann	Prof. Dr. Dominikus Heckmann, Prof. Dr. Michael Wiehl, Prof. Dr. Gerald Pirkl, Prof. Dr. Wenk

Prerequistes*
Voraussetzungen

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload
Bridge module for international master study programmes	Blended learning, block, Seminar-based teaching with practical training, partly guided self-study	Contact time/coaching: 60 h Self-study and project work: 90 h Total workload: 150 h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

This module is taught in blocks and consists of two parts, a theoretical online-taught first part and a second practical part with project work. After successfully completing the "Artificial Intelligence Robotics Starter course", students have the following technical, methodological and personal skills:
- **Professional competence:** students gain broad insights into the current topics of robot starter kits, consumer robots, service robots in relation to consumer robots, service robots in relation to artificial intelligence topics, as well as the general basics of robotics.
The students have initial knowledge from the field of human-technology interaction and from the field of cyber-physical systems.
- **Methodological competence:** Students have basic knowledge of the development of simple robots, both in a simulation environment and with physical robots. Students can classify robots and categorize human-robot interaction systems.
- **Personal competence (social competence and self-competence):** Students can work in project teams to design individual design and realize simple robot interaction systems in project teams.

Course Content
Inhalte der Lehrveranstaltungen

- Information processing & sensors for robotics
- Robot hardware & interaction hardware
- Consumer Robotics, Service Robotics, Robot Starter Kits
- Programming robots, also with graphical development environments

Teaching Material / Reading
Lehrmaterial / Literatur

Teaching material
- Material in Moodle & instructions
Literature:
- LEGO EV3 Software
- Softbank Robotics Software
- Scratch Software

Internationality
Internationalität (Inhaltlich)

Module is offered in English.
English and German literature is used.

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a)
Modulprüfungen

Type of examination *1) Prüfungsform	Type/scope including weighting *2) Art/Umfang inkl. Gewichtung	Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen
ModA	Will be announced at the beginning of the semester	Robot project: design, realization, programming, presentation and documentation

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

Programmieren für KI 1

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	PK1	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Amberg	English, German	one semester	winter semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr. Thomas Nierhoff	Prof. Dr. Thomas Nierhoff

Prerequistes*
Voraussetzungen

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload
Bridge module for international master study programmes Elective for Bachelor study programmes	Seminar-based teaching with exercises, practical training	Contact time/coaching: 60 h Self-study and project work: 90 h Total workload: 150 h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

After successfully completing the module, students have the following professional, methodological and personal skills.

Professional competence:
Students know the basics and principles of a higher imperative, functional and object-oriented programming language. They know their syntax and can apply and check it.

Methodological competence:
Students can work with basic elements such as data types, variables, expressions, data structures, iteration, recursion, function and object orientation to solve and explain simple programming tasks. They can analyze and assess the runtime behavior and correctness of programs or code sequences.

Personal competence (social competence and self-competence):
Students can analyze and solve programming problems alone and in small teams

Course Content
Inhalte der Lehrveranstaltungen

- Basics of programming
- Syntax, data types, variables, expressions, data structures, input/output
- Iteration, function, recursion
- Structuring and displaying algorithms with structure diagrams and flowcharts
- Object orientation, use of software libraries/APIs

Teaching Material / Reading
Lehrmaterial / Literatur

Teaching material
Set of slides and tasks in the learning management system
Textbooks
- Bernd Klein: Introduction to Python 3, 3rd edition, Hanser, 2018.
- Al Sweigart: Automate the boring stuff with Python (online), 2015
- Mark Pilgrim: Dive Into Python 3 (online)

Online Links:
https://www.python.org/
https://www.python-kurs.eu/

Internationality
Internationalität (Inhaltlich)

Module is offered in English.

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a)
Modulprüfungen

Type of examination *1) Prüfungsform	Type/scope including weighting *2) Art/Umfang inkl. Gewichtung	Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen
ModA	Details: will be announced at the start of the semester	Learning objectives / qualifications of the module, see above

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

Medical System Engineering

Systementwurf für medizinische Systeme

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	MSE	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Amberg	English	one semester	summer/winter semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr.-Ing. Michael Wiehl	Prof. Dr.-Ing. Michael Wiehl

Prerequistes*
Voraussetzungen

Programming in Python, mathematics basics

***Note: please also observe the preperquisites according to eximinations regulations law in the current version of the SPO.**

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload
Bridge module for international master study programmes Elective for Bachelor study programmes	Seminar with exercises	Contact time: 30h Pre- and post-processing: 60h Exam preparation: 60h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

After completing this module successfully, students will have the following professional, methodological and personal competences:

- **Professional competence:** The students know and understand special aspects, technologies and design process elements for medical systems.
- **Methodological competence:** Students will be able to setup a basic product file with relevant information for medical devices. They can plan the initial development of a medical system including risk management and design of safe software.
- **Personal competence (social competence and self-competence):** Working in international project teams, individual self-organized preparation of a product file

Course Content
Inhalte der Lehrveranstaltungen

- Overview on medical devices and technologies
- Regulatory aspects as risk classification, normative environment and obligatory laws
- System design, product design, architectures of cyberphysical medical systems
- Functional safety and IT security
- Developing safe software and usability engineering
- Biomedical signal analysis and processing in cyberphysical medical systems
- Modelling and simulation of signal acquisition and processing

Teaching Material / Reading
Lehrmaterial / Literatur

Medizintechnik by Rüdiger Kramme, Springer, 2017, Springer Handbook of Medical Technology, Springer, 2011 Anforderungen an Medizinprodukte, Hanser, 2014

Internationality
Internationalität (Inhaltlich)

Module is offered in English. English and German literature is used.

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a)
Modulprüfungen

Type of examination *1) Prüfungsform	Type/scope including weighting *2) Art/Umfang inkl. Gewichtung	Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen
ModA	25% Technical Report about simulated principle 25% Demo of simulation 25% Product file with basic elements 25% Presentation on site	Understanding a selected medical product, its system architecture, the working principle and its classification as medical product.

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden

*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

Intercultural Competence

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	IC	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Amberg	English/German	one semester	winter semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr. Tim Jüntgen	Prof. Dr. Jüntgen, Dipl.-Ing. Bianca Seidel (LBA)

Prerequistes*
Voraussetzungen

none
***Note: Please also observe the prerequisites according to examination regulations law in the current version of the SPO**

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload	
Bridge module for international master study programmes Elective for Bachelor study programmes	Seminar-based teaching	Contact time/coaching: Self-study and project work: Total workload:	60 h 90 h 150 h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

After completing this module successfully, students will have the following professional, methodological and personal competences:
The course provides students with no prior knowledge of German with basic competencies and the ability to deal with essential communicative situations of a subject-, profession- and culture-specific nature.
• Professional competence: Students understand the principles of the subject of interculturality. They learn the theoretical basics of intercultural communication and understanding.
• Methodological competence: Students are able to apply strategies to improve the handling of misunderstandings in professional and private situations. They learn to identify these situations and to appear interculturally competent.
• Personal competence (social competence and self-competence): Students acquire the interdisciplinary ability to perform in a culturally sensitive manner. Their intercultural competence is enhanced by sharpening their perception of themselves and others. They have expanded their ability to change perspective and are able to communicate with different nationalities.

Course Content
Inhalte der Lehrveranstaltungen

• Regional features
• Peculiarities of the participating nationalities
• Peculiarities of the European and especially the German culture (rules, norms, values, symbols, manners, etc.)
• Studying and working in Germany
The contents of the course can be taught in presence and/or in virtual form.

Teaching Material / Reading
Lehrmaterial / Literatur

Geert H. Hofstede: Culture's Consequences, SAGE Publications Inc., 2nd ed., 8/2/2003
Upasana Gautam: Hofstede's Cultural Dimensions Model, a summary
G. Hofstede, G.J. Hofstede, M. Minkov: Cultures and Organisations, McGraw-Hill Professional, 3. revised edition, 16/07/2010

Internationality
Internationalität (Inhaltlich)

By taking part at the module, students are able to act confidently and competently in an international environment

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a)
Modulprüfungen

Type of examination *1) Prüfungsform	Type/scope including weighting *2) Art/Umfang inkl. Gewichtung	Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen
Presentation	100%	Professional competence, methodological competence, personal competence

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

Software Project

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	SWP	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Amberg	English	one semester	winter semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr. Sandra Rebholz	Prof. Dr. Sandra Rebholz

Prerequistes*
Voraussetzungen

Software engineering, project management, databases, programming, user interfaces.
***Note: Please also note the requirements according to the examination regulations in the respective valid SPO version.**

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload
Bridge module for international master study programmes. Elective for Bachelor study programmes. Compulsory module in the degree programs Industry 4.0 Informatics, Media Informatics.	Independent implementation of a smaller software development project in a student team. Reflect on your own project-related observations and experiences in personal reflection reports. Advice from supervisors as required.	Contact time/coaching: 30 h Self-study and project work: 120 h Total workload: 150 h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

After successfully completing the module, students have the following professional, methodological and personal skills:
Professional competence: Students have expanded and consolidated their own SW development and project experience applied what they have previously learned (see prerequisites) in the overall context of a project and brought it together mentally practiced the procedure according to a (suitably adapted) process.
Methodological competence:
Students have deepened their methodological knowledge, particularly in the areas of OOA, OOD, testing and project management.
Personal competence (social competence and self-competence):
Students have experienced work-sharing software development in a team (coordination & communication, planning and distributing tasks, time estimates for tasks, coordinating changes, recognizing and dealing with risks).

Course Content
Inhalte der Lehrveranstaltungen

An assignment for the new or further development of a software product gives participants the opportunity to experience the "real case" of a software development project in a realistic way. All tasks within the project (including project management) are taken on by students. A special element is regular reflection on their own observations and experiences in order to promote learning from both mistakes and successes. Despite the obligation to deliver a usable product, the focus is on independent learning (from mistakes as well as from successes) - the tasks are therefore generally not of a commercial nature.

Teaching Material / Reading
Lehrmaterial / Literatur

Project assignment, guidelines for the procedure. Supplementary material as required. Software Engineering 1 and Software Engineering 2

Internationality
Internationalität (Inhaltlich)

Module is offered in English.
English and German literature is used.

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a)
Modulprüfungen

Type of examination *1) Prüfungsform	Type/scope including weighting *2) Art/Umfang inkl. Gewichtung	Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen
ModA (personal reflection reports and time logs of each participant, work result of the entire team)	Work result of the entire team: 40% Content of personal reflection reports and Time logs: 60%	See above under "Learning objectives"

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

Programming Starter

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	PRS	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Online, Amberg	English	one semester	summer semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr. Sandra Rebholz	Prof. Dr. Sandra Rebholz, Prof. Dr. Alexander Prinz, Prof. Dr. Christian Bergler

Prerequistes*
Voraussetzungen

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload
Bridge module for international master study programmes Elective for Bachelor study programmes	Seminar-based teaching with exercises	Contact time/coaching: 75 h Self-study and project work: 75 h Total workload: 150 h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

After successfully completing the module, students have the following professional, methodological and personal skills:

Professional competence:
Students know the basics and principles of a programming language such as "Python" or "Processing". They know their syntax and can apply it. Students know the basics of the technical language "Programming" in the two target languages German and English.

Methodological competence:
Students are able to install and set up the Python programming environment independently and master basic concepts such as data types, variables, expressions and data structures, in particular also arrays, iteration, recursion, functions and the basics of object orientation in order to solve simple programming tasks (e.g. data analysis or visual tasks) and to be able to explain them in at least one target language (English/German).

Personal competence (social competence and self-competence):
Students can analyze and solve programming problems alone and in small international & intercultural teams and solve them. They can support each other in the acquisition of technical vocabulary.

Course Content
Inhalte der Lehrveranstaltungen

1. basics of programming, iteration, function, arrays, recursion, object orientation
2. programming project (example: data analysis and visualization, creative programming)
3. technical language "Programming" (English & German)

Teaching Material / Reading
Lehrmaterial / Literatur

Teaching material
Script/slides and tasks in the learning management system Moodle
Textbooks
- Matthes, E.: Python Crash Course, 3rd Edition, No Starch Press, 2023
- Barry, P.: Head First Python, 3rd Edition. O'Reilly, 2023
- Lubanovic, B.: Introducing Python, 2nd Edition. O'Reilly, 2019
- Lutz, M.: Learning Python, 5th Edition, O'Reilly, 2013
- Klein, B.: Introduction to Python 3. for beginners and newcomers. Hanser, 2021
- Barry, P.: Python from head to toe: Up to date on Python 3. O'Reilly, 2017.

Internet sources
https://docs.python.org/3/tutorial/

Internationality
Internationalität (Inhaltlich)

- Literature sources and documentation will be used in both English and German.
- This course is taught bilingually in English and German.
- All teaching materials and readings will be provided in English and German.
- Where possible, interlingual tandem pairs will be formed for group work.

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a) Modulprüfungen		
Type of examination *1) Prüfungsform	**Type/scope including weighting *2) Art/Umfang inkl. Gewichtung**	**Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen**
ModA	Weighting: 50% / 50% Details: Compulsory exercises, graded project work with presentation	Learning objectives / qualifications of the module, see above

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

^^

Business Model Innovation

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	SEM2	Bridge Module	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
vhb	English	One Semester	Winter	Depending on availability

Module Convenor	Professor / Lecturer
Prof. Dr. Julia Heigl	Prof. Dr. Julia Heigl

Prerequisites*

None

*** Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
The module is part of the module group *Specialization Electives* of the Digital Technology and Management Bachelor's degree program. It is also used as Elective in the DHM, TM and WI programs.	Guided project work	Contact time/coaching: 60 h Self-study and project work: 90 h Total workload: 150 h

Learning Outcomes

Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:

Professional Skills:

- Students analyse current and expected environment, industry, and company specifics, particularly with regard to the effects of digitization (and other megatrends).
- Students will analyse customer needs and develop new value propositions.
- Students will analyse, develop and evaluate business models, including revenue model and necessary architecture (resources, activities, partnerships).

Methodological Skills:

- The students apply common methods of business model development, requirements and needs analysis as well as innovation approaches for the further development of the business model in a concrete (practical) project. They use personas, business model canvas and other templates.
- Students recognize intercultural and interdisciplinary challenges in teamwork and adapt their working methods accordingly.
- The students use digital cooperation and communication tools.

Personal Skills (Social Competence and Self-competence):

- Students will be able to cooperatively plan and execute a team project on time, working effectively and thoughtfully, especially in a heterogeneous, interdisciplinary, and international team, and if necessary, leading the team.
- Students will be able to communicate results effectively and express complex information concisely and comprehensively, both orally and in writing.

Course Content

Global megatrends such as digitization have a radical impact on what and how companies create benefits for customers (value proposition innovation), how these benefits are delivered (architectural innovations) and how companies earn money (revenue model innovations). Therefore, existing business models must be deliberately changed in the sense of a business model innovation or others must be created from scratch. In contrast to product or process innovations, business model innovations thus directly address a company's business model. Not only are customer needs better satisfied, but the basic structures and competitive rules of the industry are also called into question.

As part of the module, students work on an international project in teams with students from other universities on a current, real-life practical issue in which a new platform business model (virtualtraveller.com) is to be scrutinized and made more attractive for both end users (young travelers) and advertisers (including FinnAir, Samsung, but also small local providers).

The task will be worked on in defined sub-steps, supported by teaching units on the following topics:
- Working with the Business Model Canvas: analysis, development and evaluation of an own business model.
- Impact of digitalization and other megatrends on business models and organizations
- Platform business
- Basics of the design thinking process
- Understanding user groups and their needs, requirements and problems (developing persona)
- Working with a 360° camera, shooting your own film
- Brainstorming and creativity techniques

- Evaluating market potential and revenue model
- Business models in practice

Teaching Material / Reading

Kim, W. C./Mauborgne, R.: How to create uncontested market space and make the competition irrelevant. Harvard Business Review, 4. Jahrgang (2005), Nr. 13, 1-2.
Osterwalder, A./Pigneur, Y.: Business model generation: a handbook for visionaries, game changers, and challengers. John Wiley & Sons, 2010.
Robier, J.: UX Redefined. Winning and Keeping Customers with Enhanced Usability and User Experience, Springer 2016.

Internationality (content-related)

The project takes place in cooperation with the universities Haaga-Helia University of Applied Sciences, Helsinki/Finland and Thomas More Hoge-school, Geel/Belgium.
Teams are international and must communicate in English.
The accompanying lectures will also be held in English.
The practical question dealt with is of international relevance.

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination[*1)]	**Type/Scope incl. Weighting** [*2)]	**Learning Objectives/Competencies to be Assessed**
Module work (ModA)	Project work (written + oral) in groups of approx. 6 students each (2 from Weiden, 4 from Finland and/or Belgium) on a business question presented at the beginning of the semester in several phases, which are presented at the project kick off and are to be worked on successively. Each student has to contribute individually to the common task. The overall results are to be submitted in the form of a pitch video (English) as well as a written summary (approx. 15 pages per German group of 2, language English or German), weighting 50/50.	The group project is used to test the practical learning content and competence profiles, including teamwork and presentation skills.

[*1)] Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
[*2)] Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.

Web-Technologies

Classification Zuordnung zum Curriculum	Module ID Modul-ID	Kind of Module Art des Moduls	Number of Credits Umfang in ECTS-Leistungspunkte
	WEB	Bridge Module	5 ECTS

Location Ort	Language Sprache	Duratrion of Module Dauer des Moduls	Frequency of Module Vorlesungsrythmus	Max. Number of Participants Max. Teilnehmerzahl
Amberg	English	one semester	summer semester	

Module Convenor Modulverantwortliche/r	Professor / Lecturer Dozent/In
Prof. Dr. Thomas Nierhoff	Prof. Dr. Dieter Meiller, Prof. Dr.-Ing. Michael Wiehl, Prof. Dr. Thomas Nierhoff

Prerequistes*
Voraussetzungen

Note: Please also note the requirements according to the examination regulations in the currently valid SPO version.

Usability Verwendbarkeit	Teaching Methods Lehrformen	Workload
Bridge module for international master study programmes Elective for Bachelor study programmes	Seminar-based teaching with exercises	Contact time/coaching: 60 h Self-study and project work: 90 h Total workload: 150 h

Learning Outcomes
Lernziele / Qualifikationen des Moduls

After successfully completing the module, students have the following professional, methodological and personal skills:
Professional competence:
Students have a sound knowledge of HTML, CSS and Javascript. They can code the Document object model of a website and design its appearance responsively for different output devices. They can also program the interactive behavior of the website. Students know the basics of the technical language "web technologies" in the two target languages German and English.
Methodological competence:
Students have a basic knowledge of how web technologies and the internet work. They can create static web pages using standard web technologies. They can use screen design tools to create web page designs create web page designs that prepare graphics and other audiovisual media for distribution on the web and then integrate them into the created web pages.
Personal competence (social competence and self-competence):
Students can design and code user-friendly web pages as part of a project team. They can also familiarize themselves with more in-depth areas of web programming. They can support each other in the acquisition of technical vocabulary.

Course Content
Inhalte der Lehrveranstaltungen

Layered architecture of the Internet, HTTP protocol, Document Object Model, acquisition of knowledge in XML and SGML, HTML, CSS, Javascript, ECMAScript, responsive web design, usability and accessibility. Summary, analysis and discussion of current English-language web technology texts.

Teaching Material / Reading
Lehrmaterial / Literatur

- S. Krug: Don't Make Me Think, Redline GmbH, Heidelberg, 2006
- F. Bongers: XHTML, HTML und CSS, Galileo Press, Bonn, 2007
- D. Crockford: JavaScript – the good parts, O'Reilly, Sebastopol, CA, 2008

Internationality
Internationalität (Inhaltlich)

Module is offered in English.
English and German literature is used.

Method of Assenssment (ggf. Hinweis zu Multiple Choice - APO §9a)
Modulprüfungen

Type of examination *1) Prüfungsform	Type/scope including weighting *2) Art/Umfang inkl. Gewichtung	Learning objectives/competencies to be assessed Zu prüfende Lernziele/Kompetenzen
ModA	Length: 75 minutes Details: Programming tasks on the PC	Understanding of basic knowledge of web and internet technologies and coding and the ability to independent coding of web pages and their technical language

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please additionally provide information on the weighting (in % share) and, if applicable, also a reference to a bonus system.